S. S. HALL.

SELF LOCKING AUTOMATIC STOP FOR GOVERNORS.

APPLICATION FILED JUNE 4, 1910.

979,289.

Patented Dec. 20, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

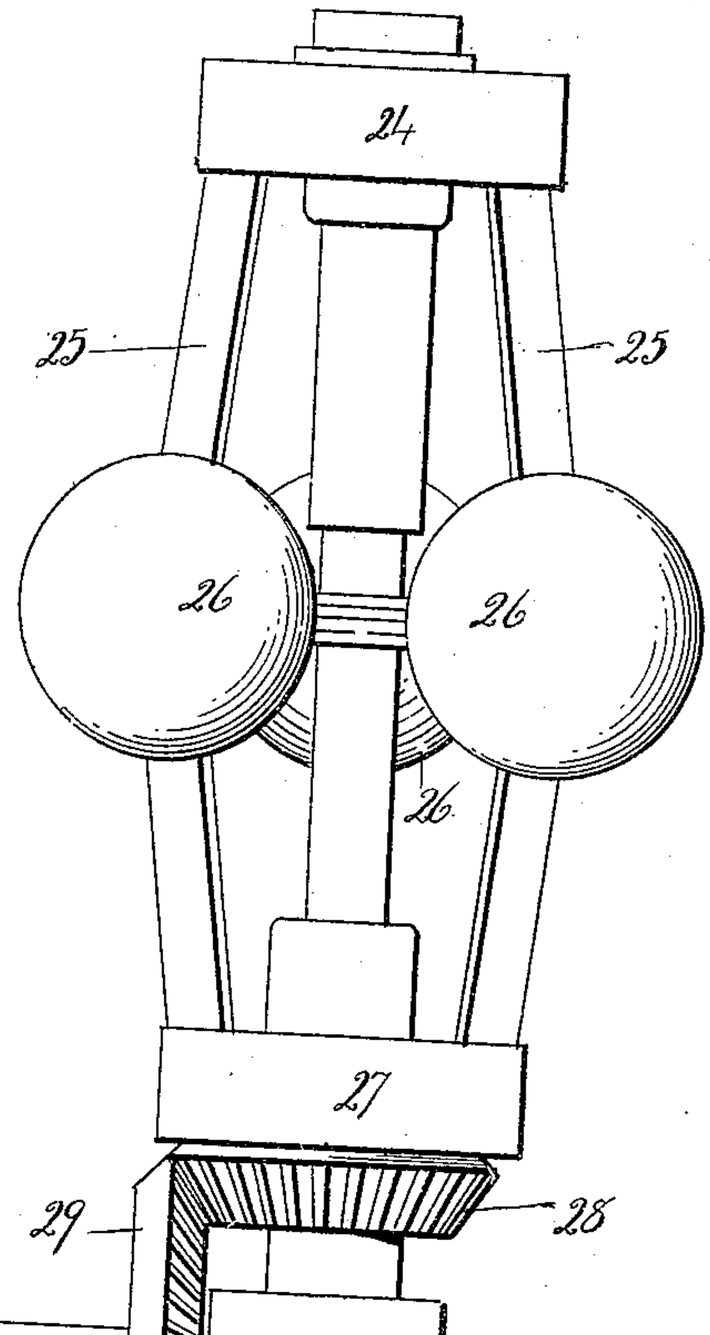

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Fig. 3.

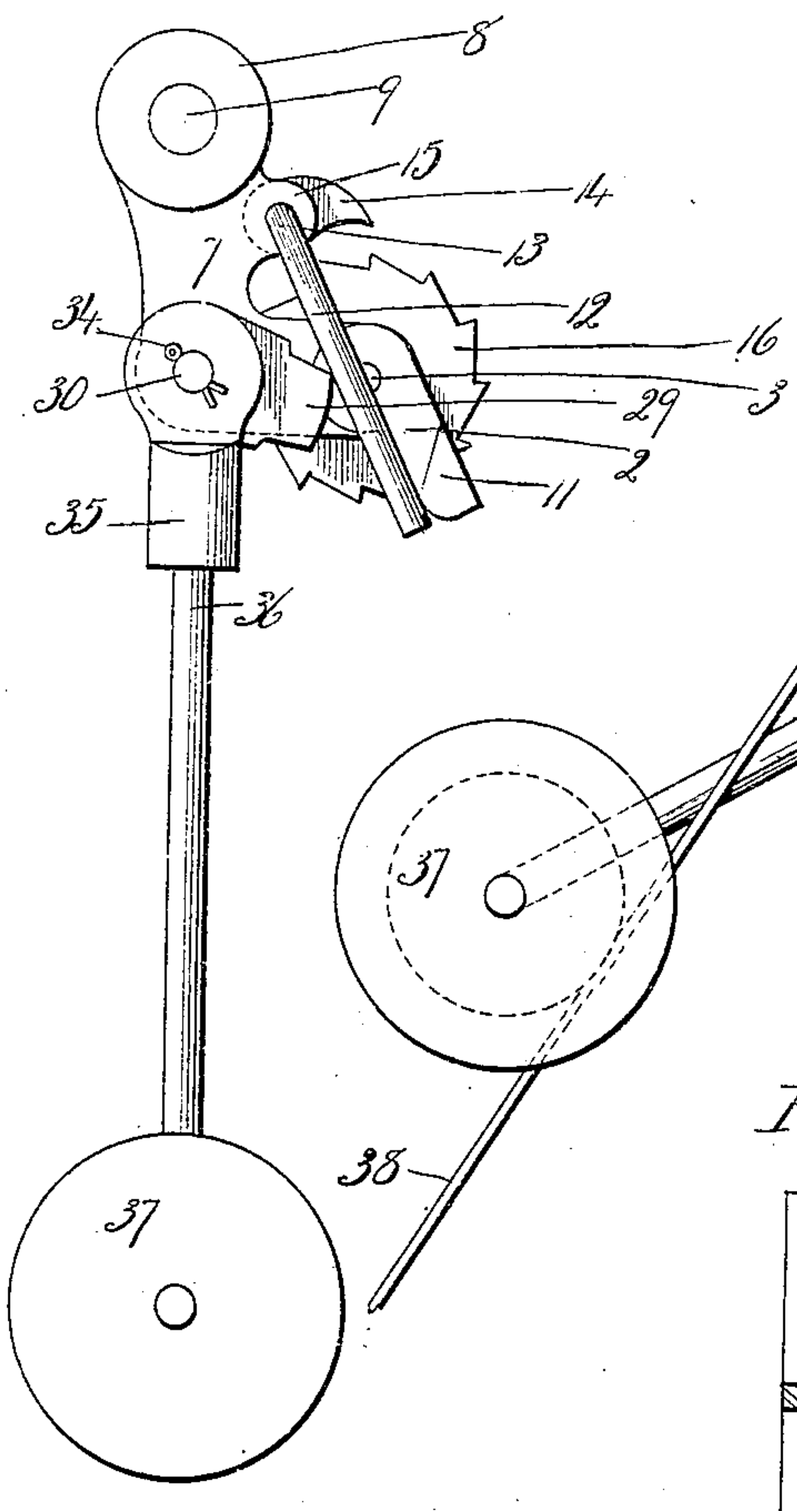


Fig. 2.

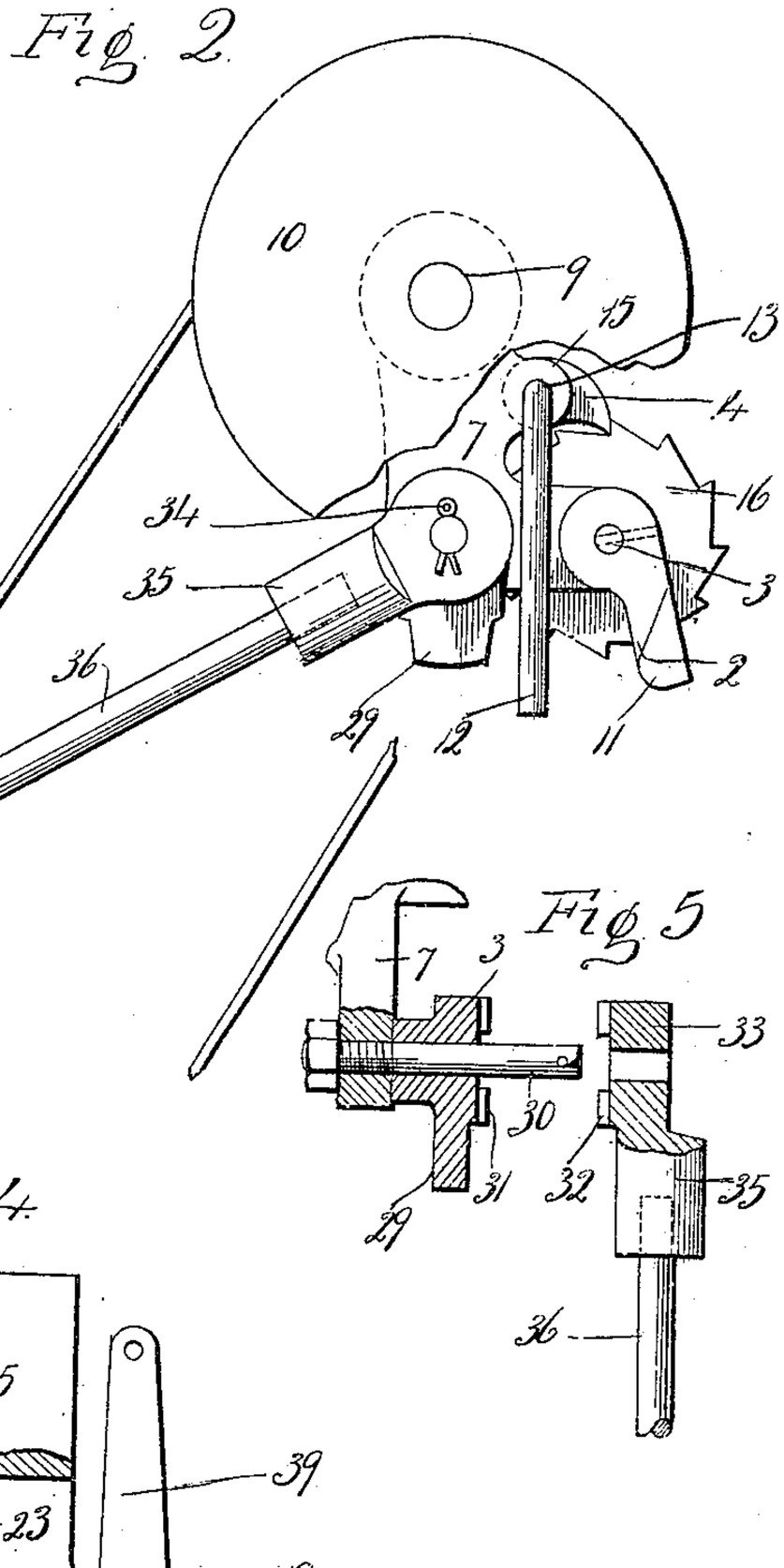
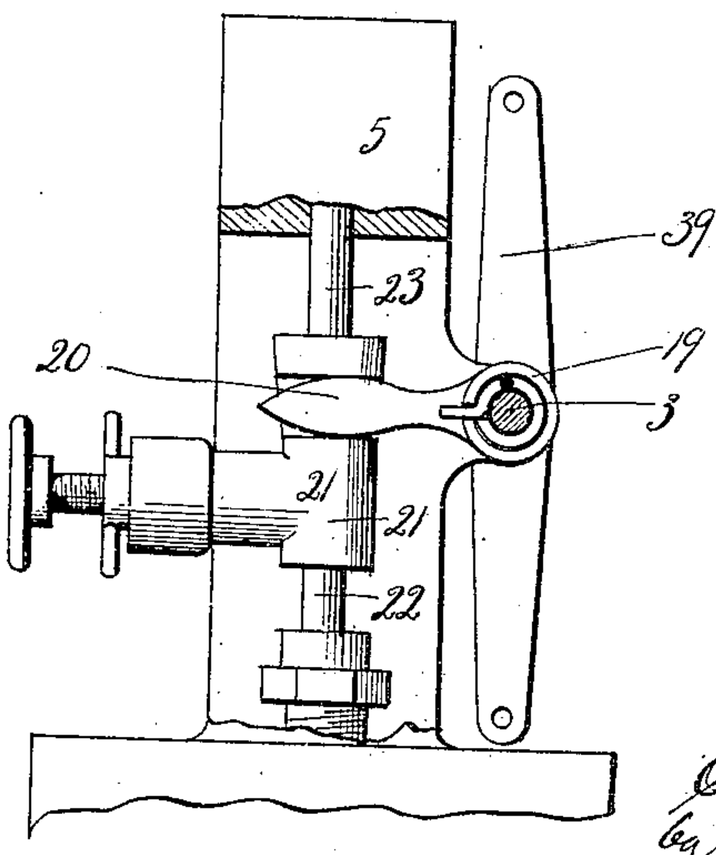


Fig. 5

Fig. 4.



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UNITED STATES PATENT OFFICE.

STEPHEN S. HALL, OF PORTLAND, CONNECTICUT, ASSIGNOR TO THE PICKERING GOVERNOR CO., OF PORTLAND, CONNECTICUT, A CORPORATION.

SELF-LOCKING AUTOMATIC STOP FOR GOVERNORS.

979,289. Specification of Letters Patent. Patented Dec. 20, 1910.

Application filed June 4, 1910. Serial No. 565,126.

To all whom it may concern:

Be it known that I, STEPHEN S. HALL, a citizen of the United States, residing at Portland, in the county of Middlesex and State of Connecticut, have invented a new and useful Improvement in Self-Locking Automatic Stops for Governors; and I do hereby declare the following, when taken in connection with the accompanying drawings and the letters of reference marked thereon, to be a full, clear, and exact description of the same, and which said drawings constitute part of this specification, and represent, in—

Figure 1 a view in front elevation of a ball-governor provided with my self-locking automatic stop. Fig. 2 a broken detail view thereof in left hand side elevation showing the automatic stop in its normal position in which the idler pulley is supported by the power-belt. Fig. 3 a corresponding, but less comprehensive view showing the automatic stop as locked. Fig. 4 a broken view in left hand side elevation showing the connection of the spring-shaft 3 with the valve-rod 21. Fig. 5 a broken view in vertical section showing the means for adjusting the position of the arm carrying the idler which is supported upon the power-belt.

My invention relates to an improved automatic stop for governors, the object being to make such stops self-locking so as to prevent any pressure of steam from opening the valve.

With these ends in view my invention consists in certain details of construction and combinations of parts as will be hereinafter described and pointed out in the claims.

For the illustration of my invention, I have shown it as applied to an automatic ball-governor stop forming the subject of U. S. Patent No. 868,119 granted October 15, 1907, to the Pickering Governor Co. of Portland, Connecticut, on the application of Richard H. Pascall. I do not, however, limit my invention to such use, since it is applicable to other ball governors which it is desirable to provide with means to lock the valve in its closed position after the governor has been stopped.

As herein shown, I employ a locking-lever 2 secured to the projecting left hand end of an oscillating, horizontal spring-shaft 3 journaled at its right hand end in a lug 4 offsetting from the governor-frame 5 and at its left hand end in a lug 6 offsetting from an arm 7 depending from the shaft-bearing 8 which is made integral with the said frame 5 and which receives the shaft 9 carrying the power-pulley 10. The said locking-lever 2 is formed at its outer end with a lug 11 the cam-like inner face of which co-acts with the outer face of a tripping-arm 12 which forms an extension of the shaft 13 of a pawl 14 located between two lugs 15 cast integral with the shaft-bearing 8 and forming journal-bearings for the said pawl-shaft 13, which, as shown, consists of a heavy rod bent to form it and the said tripping-arm 12 which latter extends downward at a right angle with respect to it. The said pawl 14 co-acts with a ratchet-wheel 16 mounted so as to turn freely upon the left hand end of the spring-shaft 3 and formed upon its inner face with a nut 17 recessed for the reception of the left hand end of a coiled spring 18 which is coupled with the nut 17 and hence with the said ratchet-wheel. The said spring 18 has its opposite end inserted into and coupled with the hub 19 of a yoke 20 the arms of which enter a groove in the upper end of a collar 21 secured to the upper end of the lower section 22 of the valve-rod the upper section 23 of which is inserted into the upper end of the said collar 21. The hub 19 is secured to the shaft 3 so that the yoke 20 will be oscillated thereby. At its upper end the section 23 of the valve-rod is connected in the usual manner with a revolving head 24 connected by spring arms 25 carrying balls 26, with a revolving head 27 which carries a bevel-gear 28 meshed into a bevel-gear 29 on the inner end of the power-shaft 9 aforesaid, this being the usual construction of ball-governors.

The inner face of the tripping-arm 12 co-acts with a cam 29 mounted so as to turn upon a horizontal stud 30 fixed in the arm 7 aforesaid, the outer face of the said cam being formed with teeth 31 for engagement with teeth 32 upon the inner face of a hub 33 mounted upon the outer end of the said stud 30 and secured in place thereon by a cotter-pin 34. The said hub 33 has a depending socket 35 receiving the upper end of a rod-like arm 36 carrying at its lower end an idler 37 which it is designed shall normally ride upon the outer face of the power-belt 38 which runs over the power-

pulley 10 from any convenient source of power. The intermeshing teeth 31 and 32 provide for positioning the cam 29 and hub 33 with respect to each other so as to set the idler 37 in proper position with respect to the pitch or inclination of the power-belt 38. The extreme left hand end of the shaft 3 is provided as shown with an operating-lever 39 which provides for cutting off the steam temporarily without the operation of the stop and being old need not be described. By the application of an ordinary monkey-wrench to the nut 17 the coiled spring 18 is put under the tension called for by the conditions under which the governor is to be used. When the spring 18 is being placed under tension as described, the idler 37 is raised to its normal position which is the position in which it is supported by the power-belt 38 when the governor is running properly.

The raising of the idler 37 into its normal position by the belt 38 or otherwise, clears the cam 29 from the tripping-arm 12 and permits the same to swing by gravity from front to rear, whereby the pawl 14 is allowed to fall or ride upon the ratchet-wheel 16 preparatory to winding up the spring 18 by a wrench applied to the nut 17 which will be turned until the spring has been placed under the required tension. When the wrench is removed from the nut 17, the spring will be held against uncoiling by the pawl 14 and the tripping-arm 12 will be left hanging, as it were, between the locking-lever 2 and the cam 29, as seen in Fig. 2. Now if for any reason the belt 38 should be put out of service, such as by its parting, the heavy idler 37 instantly falls by gravity, forcing the cam 29 against the tripping-arm 12 and thus forcing the same from rear to front whereby the pawl 14 is lifted and disengaged from the ratchet 16 which has hitherto held the spring 18 under tension. The ratchet 16 being released, the tension of the spring 18 and the weight of the valve (not shown), turns or rocks the spring-shaft 3 from front to rear, and as it turns, the valve descends and shuts off the steam after which no amount of steam pressure on the valve can lift it and permit the regulator to start again, for the reason that the tripping-arm 12 is wedged, as it were, between the lug 11 of the locking-lever 2 and the cam 29 as shown in Fig. 3. With the arm 12 so held, the shaft 3 cannot rotate as required for the lifting of the valve because the lug 11 bears upon the outer face of the arm 12 the inner face of which bears directly upon the cam 29 which is held in its locking position by the weight of the idler 37. The locking-lever 2 therefore constitutes what amounts to a positive lock for locking the automatic stop in its operation position. The valve cannot be lifted until the idler 37 has been raised into its normal position and the cam 29 thus moved rearward away from the tripping-arm 12 which is then permitted to swing rearward. This in turn permits the locking-lever 2 to be swung rearward without which the spring-shaft 3 cannot be turned in the direction required for raising the valve from its seat.

I claim:—

1. In a ball-governor, the combination with the balls and valve-rod thereof, of an idler which permits the valve of the governor to close when the idler falls by gravity, a spring-actuated tripping-device operated by the fall of the idler, and a lock interposed between the idler and the tripping-device for holding the valve upon its seat.

2. In a ball-governor, the combination with the balls and valve-rod thereof, of an idler, a spring-actuated tripping-device operated by the idler, and a cam-lock co-acting with the tripping-device and the idler for holding the valve upon its seat.

3. In a governor, the combination with the balls and valve-rod thereof, of an idler, a spring-shaft connected with the valve-rod, a ratchet, a pawl, a spring placed under tension by the said ratchet and pawl, a tripping-arm connected with the pawl, a cam operated by the idler and co-acting with the tripping-arm, and a locking-lever connected with the spring-shaft and also co-acting with the said tripping-arm which is held between the locking-lever and the cam when the idler falls by gravity.

In testimony whereof, I have signed this specification in the presence of two subscribing witnesses.

STEPHEN S. HALL.

Witnesses:
GEO. C. PASCALL,
H. SEXTON.